

REMARKS

The Examiner rejected claims 1-2, 4 and 5 under 35 USC 103(a) as being unpatentable over Reijnders (US 6,464,121) in view of DeTorre (US 4,140,820). Claims 3 and 6-8 were rejected under 35 USC 103(a) as being unpatentable over Reijnders in view of DeTorre as applied to claims 1,2,4, and 5 above, and further in view of Duecker (US 5,927,582). Claims 9-21 were rejected under 35 USC 103(a) as being unpatentable over Reijnders in view of DeTorre in further view of Duecker.

CLAIMS 1-2, 4 and 5 rejected under 35 USC 103(a)

The Examiner rejected claims 1-2, 4 and 5 under 35 USC 103(a) as being unpatentable over Reijnders (US 6,464,121) in view of DeTorre (US 4,140,820). The office action states that Reijnders discloses an apparatus for separating individual boards from a multiple array with pre-scored planes (3) and a plurality of electrical components (Fig 3) at least one wedge shaped splitting element (20). The office action states that Reijnders fails to disclose a torque inducing element, a stabilizing element, that the splitting element is block shaped, and the torque inducing element forces the board array without loading the electrical components. The office action then asserts that DeTorre discloses at least one torque inducing element (112), that the splitting element is block shaped (116), that the torque inducing element forces the board array without loading the electrical components, and a stabilizing element (114).

The Applicant respectfully traverses this rejection on several grounds. First off, the Applicant respectfully reasserts that the DeTorre patent is non-analogous art and therefore is not proper prior art. It is clearly not in the field of endeavor of electronic circuit production as is the present invention nor is it reasonably pertinent to the problem at hand. The principles of breaking glass along a score are well known and have been utilized for centuries. Glass is itself a rigid crystalline brittle structure. The present invention, however, goes to separating complex electrical circuit structures 12 from a multiple board array 20. Unlike glass, simple application of force to the surface can result in injury to electrical components 16 mounted on the circuit board 12. Additionally, while simple scoring and large scale force may be applicable to glass

breaking, such techniques are far too unrefined for application to circuit board separation. Therefore, the Applicant respectfully submits that the DeTorre patent is not properly usable as prior art. The Examiner has also failed to provide any motivation to combine the Reijnders and the DeTorre references as could be referenced in material found in either reference. This combined with the non-analogous nature of the DeTorre reference makes such a combination unreasonable.

Additionally, the Applicant respectfully traverses the Examiner's assertion that the DeTorre reference discloses or teaches a stabilizing element (114) as asserted by the office action. The Applicant calls the Examiner's attention to column 10 lines 29-34 of the DeTorre reference. The Applicant notes that elements 112, 114, and 116 of the DeTorre reference are all taught as movable anvils used to apply a bending moment about the middle one. While these may be torque inducing, they are clearly not the equivalent of the present invention's stabilizing element 44 utilized to prevent flexing of the circuit board array 20. If subjected to the DeTorre apparatus, large scale board flexing would be guaranteed based upon the physics of the design taught by DeTorre. Therefore, in addition to being non-analogous, the DeTorre reference does not teach every element of the present invention as taught in claims 1-2 and 5.

Finally, it should be noted that the present invention includes a torque element capable of loading the multiple board array 20 without loading the electrical components 16 as not taught by DeTorre or Reijnders. The Examiner notes that he believes the combination of Figure 6 of the DeTorre reference applied to the bottom of figure 7 of the Reijnders reference would render the present invention obvious. The Applicant again traverses this assertion. No motivation to combine has been adequately argued by the office action. Furthermore, no address of the non-analogous nature of the DeTorre reference has been addressed (an argument not rendered moot by the addition of the Reijnders reference). The present invention further includes a torque element utilizing edge loading as is not taught by DeTorre nor Reijnders either alone or in combination. And neither Reijnders nor DeTorre, either alone or in combination, teaches the reduction of board flex through the use of surface loading. The supposition that surface loading to the back side of a circuit board would shield all components from loading ignores the geometry of circuit design wherein components have leads the project through the circuit

board and can transmit loading up through to the components themselves. For these and the aforementioned arguments, the Applicant respectfully requests the rejections to claims 1-2, 4 and 5 be removed.

Claims 3 and 6-8 rejected under 35 USC 103(a)

Claims 3 and 6-8 were rejected under 35 USC 103(a) as being unpatentable over Reijnders in view of DeTorre as applied to claims 1,2,4, and 5 above, and further in view of Duecker (US 5,927,582). The Office action stated that Reijnders and DeTorre discloses the invention in regards to claims 1,2,4, and 5 but fails to disclose that the stabilizing element includes a plate member and a plurality of springs, that at least one torque element is a pneumatic lever, or a transport with a plurality of wheels. The office action states that Duecker teaches a plate member (41) and a plurality of springs (44), a transport element (24) with a plurality of wheels (25), and that the torque element is pneumatic. The office action thereby asserts it would have been obvious to combine these three references to arrive at the present invention.

The Applicant respectfully traverses the Examiner's rejections. The Applicant respectfully reasserts all of the above arguments regarding the inappropriateness of the DeTorre reference as well the inadequacies of the Reijnders and DeTorre references, either alone or in combination, for failing to teach every element of the present claimed invention. The Applicant further asserts that Deucker is inappropriate as a prior art reference as well as it is non-analogous. Deucker teaches an apparatus for ripping apart stacks of corrugated cardboard boxes. The subject matter, the scale of operation, the forces involved, the physics involved with ripping cardboard are all well outside the field of endeavor of the present invention and would not be reasonable looked to as pertinent to the present invention's problem. Again, the Deucker reference deals with a material that is non-comparable to the loaded circuit board of the present invention. The stack of cardboard will not be damaged by minor flexing or loading forces applied to the circuitry mounted on its surface (as it inherently has none). Furthermore the ripping functions it utilizes would place it far beyond any considerations of usage.

What the office action attempts to construe as teaching a stabilizing element with a plate and springs is in fact a high pressure clamp whose purpose is to secure the stack of

cardboard such that the ends can be ripped off and not to stabilize a circuit board to prevent board flex. Again, neither the DeTorre reference nor the Deucker reference are proper prior art as they are both non-analogous. Furthermore, as the Reijnders and DeTorre references fail to teach every element of the underlying claims, the combination of Reijnders, DeTorre and Deucker fails to teach every element of the rejected dependent claims. Applicant further reasserts the objection to the lack of any motivation to combine either asserted or referenced from any portion of the cited references. Again, the addition of the Reijnders references did not render moot the arguments thus far asserted by the Applicant regarding the DeTorre and Deucker references. Therefore, the Applicant respectfully requests the rejections to the above claims be removed.

Claims 9-21 were rejected under 35 USC 103(a)

Claims 9-21 were rejected under 35 USC 103(a) as being unpatentable over Reijnders in view of DeTorre in further view of Duecker. The Applicant traverses these rejections and asserts the identical arguments as those asserted by the applicant to these references being applied to claims 1-8. Furthermore the Applicant respectfully traverses the rejection of claims 16-19 on further grounds. Claims 16-19 are directed towards a method of separating individual circuit boards from a multiple board array. Neither DeTorre or Deucker either alone or in combination teaches anything about processing circuit boards in any fashion. Additionally, these references are clearly non-analogous when applied to such procedures. Proper motivation to combine with the Reijnders has not been provided. As previously argued, the nature, scale, physics and methodologies utilized by these references do not contain all the limitations of the present invention and are not within its field of endeavor. Nor, due to the wide discrepancies of applications, are they reasonably pertinent to the problem the present invention addresses. Therefore, the Applicant respectfully requests the rejections to claims 9-21 be withdrawn.

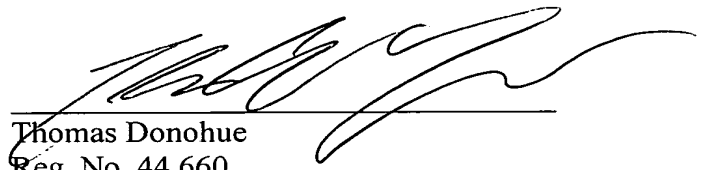
CONCLUSION

The Applicant would like to thank the Examiner for his assistance. In light of the above amendments and remarks, Applicant submits that all objections and rejections are

now overcome. Applicant has added no new material to the application. The application is now in condition for allowance and expeditious notice thereof is earnestly solicited.

Should the Examiner have any questions or comments that would place the application in better condition for allowance, the Examiner is respectfully requested to call the undersigned attorney.

Respectfully submitted,



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